

**THE FIRST RECORD OF AN AMYCTERINE WEEVIL
(COLEOPTERA: CURCULIONIDAE: AMYCTERINAE) FEEDING
ON ORCHIDACEAE**

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Abstract

Tetralophus sculpturatus Waterhouse is reported feeding on sun orchids (*Thelymitra* J.R. Forst. & G. Forst.), the first record of amycterine weevils feeding on Orchidaceae.

Introduction

Until Howden (1986) published host records for ten genera of Amycterinae, little was known concerning larval and adult food sources of these diverse and endemic Australian weevils. Previous researchers had noted adult food plants but understood little in regard to larval hosts. Howden's (1986) studies revealed that most, if not all, amycterines feed on monocotyledons (plant classification here follows APG II (2003) in its widest sense), mainly Poales [especially Poaceae, but also Cyperaceae (*Lepidosperma*), Ecdiocolleaceae (*Ecdiocollea*) and Restionaceae (*Lepidobolus*)] and Asparagales [Asparagaceae *sensu lato* (*Dichopogon*, *Lomandra*) and Xanthorrhoeaceae *sensu lato* (*Bulbine*, *Dianella*, *Stypandra*, *Xanthorrhoea*)]. All records of amycterines from eudicot groups were for adults only (*Acacia*, the myrtaceous shrubs *Melaleuca* and *Leptospermum* and several genera of Papilionaceae) and almost certainly do not represent real (larval) hosts (Howden 1986).

Given the records of amycterines feeding on Asparagales (to which the family Orchidaceae belongs), including soft lilies like *Dichopogon* and *Bulbine* (Howden 1986, May 1994), it is surprising there are no published records from orchids, especially given the attention orchid biology receives from professional and amateur botanists. Here I report four independent records of *Tetralophus sculpturatus* Waterhouse (Fig. 1) feeding on the foliage of a sun orchid, *Thelymitra* J.R. Forst. & G. Forst. – probably a member of the *Thelymitra pauciflora* R. Br. group. These are the first confirmed host records for *Tetralophus* Waterhouse and of any amycterine weevils feeding on orchids. *Tetralophus* contains only one other species, *T. excursus* Pascoe, also occurring in southeastern Australia. Zimmerman (1993), noting that '*Tetralophus* species are extraordinarily and confusingly variable', synonymised the third previously recognized species, *T. incanus* Pascoe, with *T. sculpturatus* Waterhouse. Examination of material in the Museum of Victoria revealed a specimen of *T. sculpturatus*, without locality information, but with the collection data 'found in flower of orchids. W.K. 9.94'. These data are unclear, however, as to whether or not the individual was feeding on the plant and also give no indication as to the identity of the orchid genus.

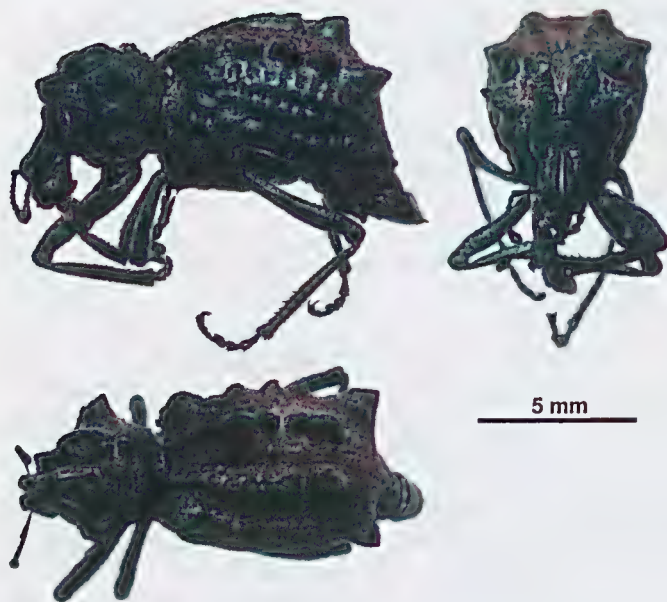


Fig. 1. Ventral, frontal and oblique dorsal views of a specimen of *Tetralophus sculpturatus* Waterhouse, collected 3.1 km WNW of Driffield, Victoria (deposited in the Australian National Insect Collection).

Tetralophus has a relatively narrow Bassian distribution, including southeastern South Australia, Victoria, southern New South Wales (Green Cape, Sydney) and Tasmania (Flinders Island). Figure 2 shows the distribution of *Tetralophus* as based on material in the Museum of Victoria (Melbourne) and the Australian National Insect Collection (Canberra), as well as on records in Zimmerman (1993) and by the author.

Observations

All new records are from remnant dry sclerophyll forest near the junction of Vary's Track and Golden Gully Road, 3.1 km WNW of Driffield, Victoria (ca 38°15'52"S, 146°17'56"E, alt. 110 m). The voucher specimens deposited in the Australian National Insect Collection and the Museum of Victoria readily conform to the illustration of *T. sculpturatus* provided by Zimmermann (1993) and other examined material.

The first observation of this host association reported here (by N. Porch and R. Porch), on 1 August 1998, was of an individual that had ascended a 20 cm long *Thelymitra* leaf about three-quarters of its length from the ground and was feeding on one margin of the leaf when it was collected. The second observation (by R. Porch), made on 6 October 2000, was of an individual

found feeding on a *Thelymitra* stem. It had apparently consumed about 40% of the stem, presumably by feeding from its tip and reversing down the stem as it fed. This method of feeding makes these weevils rather conspicuous in open forest as they cling to the leaf or stem as it waves precariously about. The third observation (by R. Porch) occurred on 7 October 2001, and the fourth, most recent one (by R. Porch) on 10 September 2005; both of weevils retreating down a *Thelymitra* leaf as they consumed it. All four observations were made between 10h00 and 16h00, suggesting that these weevils are diurnal, an unusual habit that was previously noted for some other members of the subfamily (Howden 1986).

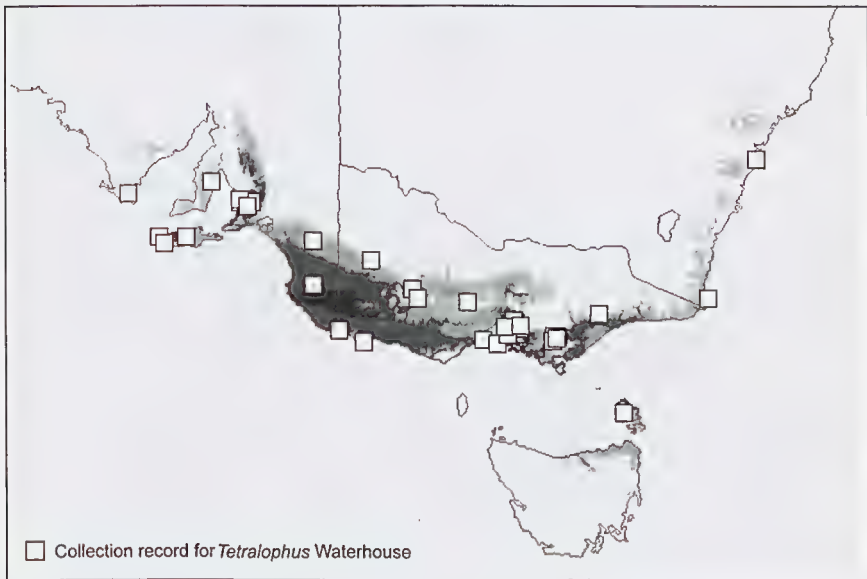


Fig. 2. Distribution records for *Tetralophus Waterhouse* and prediction of areas that are bioclimatically suitable, based on the BIOCLIM modeling function of BioLink (Shattuck and Fitzsimmons 2002). Prediction used annual and seasonal temperature layers, annual precipitation and an additional custom layer of warm season rainfall (precipitation of the warmest quarter); darker areas indicate climate types similar to the majority of distribution records, lighter areas indicate climates at the margins of the bioclimatic envelope for the genus where there are fewer collection records.

Discussion

Although larvae of this species were not located (a search would probably impact on the local *Thelymitra* population considerably), it is likely that they feed and develop within the orchid tubers or, alternatively, feed on the underground stem of the plant. May (1994) noted that 'all amycterine larvae

found so far are, with one exception, soil dwellers, living free and feeding on roots, or entering tubers, bulblets and corms of plants'; the exception being a species of *Acantholophus* Boisduval that feeds in the crowns of *Xanthorrhoea*.

It would be interesting to know whether *Tetralophus sculpturatus* is restricted in its host range to sun orchids or also feeds on other orchid genera, and whether the other *Tetralophus* species, *T. excursus* Pascoe, has similar habits. Further, given the widespread occurrence of *Thelymitra* and other succulent-leaved terrestrial orchid genera (such as *Calochilus*, *Prasophyllum* and *Microtis*) across the southern and eastern parts of the Australian continent, it is surprising that *Tetralophus* is not also more widespread. It is possible that elsewhere in the range of these orchid taxa, especially in southwestern Australia, other genera of small amycterines may feed on them in a similar way.

References

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